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ASSIGNMENT BOOKLET

9110 Mathematics 9
Module 6

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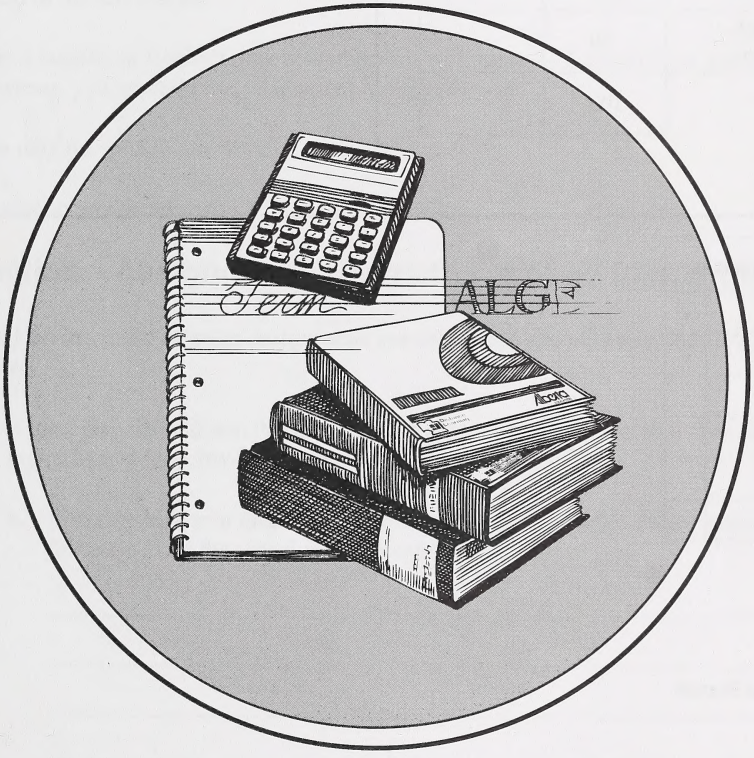
MATHEMATICS 9

MODULE 6



Data Management

ASSIGNMENT BOOKLET

Distance Learning

Alberta EDUCATION

FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Mark
Section 1 Assignment	25	
Section 2 Assignment	15	
Section 3 Assignment	20	
Final Module Assignment	40	
	100	

Teacher's Comments

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Parents	
General Public	
Other	

Mathematics 9
Assignment Booklet
Module 6
Data Management
Learning Technologies Branch
ISBN 0-7741-1397-9

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ASSIGNMENT BOOKLET
MATHEMATICS 9 – MODULE 6: DATA MANAGEMENT

Your mark on this module will be determined by how well you do your assignments in this booklet.

Work slowly and carefully. If you are having difficulties, go back and review the appropriate section.

There are three section assignments and one final module assignment in this Assignment Booklet. The total value of these assignments is 100 marks. The value of each assignment is stated in the left margin.

This Assignment Booklet may be completed with the use of a calculator and resource materials. However, you must do the assignment **independently**.

You may do your rough work on your own paper.

Be sure to proofread each assignment carefully.

Section 1 Assignment: Bivariate Data and Scatterplots

25

Read all the parts of your assignment carefully and record your answers in the appropriate place.

1. It has been claimed that drinking alcohol slows a person's reaction time and is therefore a factor in accidents involving drivers who have been drinking.

(2) **a.** Describe how you might design an experiment to test this claim without actually putting drivers behind the wheel while intoxicated.

_____

_____

_____

_____

(1) **b.** What are the two variables in your experiment?

_____

(2)

c. List four factors that may affect the results.

_____

_____

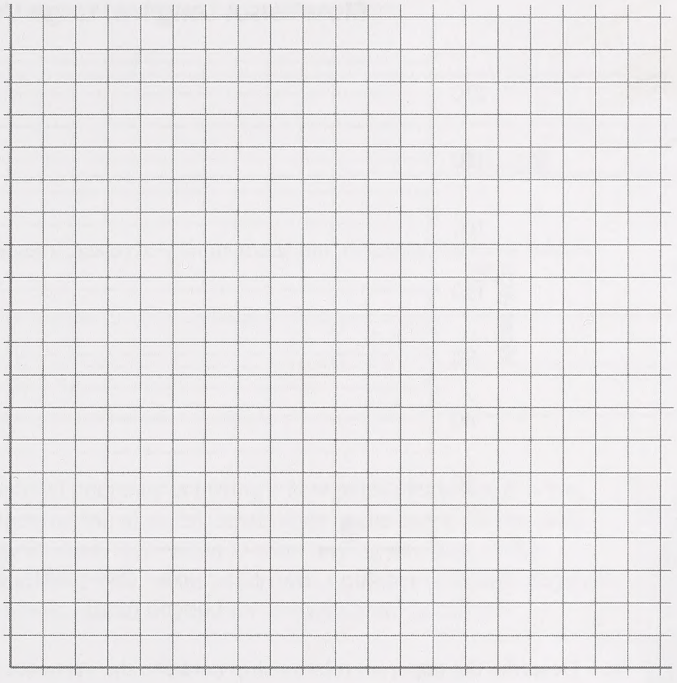
_____

_____

2. The following data was obtained to find out if a student's Mathematics 9 mark is related to how well the student will do in Mathematics 10. Use this information to answer the following questions.

Math 9 Grade (%)	Math 10 Grade (%)	Math 9 Grade (%)	Math 10 Grade (%)
75	66	65	69
80	80	65	57
85	75	93	82
70	72	90	94
78	65	87	85
100	95	100	90
76	82	82	72
50	35	55	50

(3) **a.** Make a scatter plot of the data on the following grid; then draw a line of best fit by inspection.



(1) **b.** Why are most of the points clustered at the upper right?

_____

_____

(1) **c.** Why aren't there any Math 9 marks below 50%?

_____

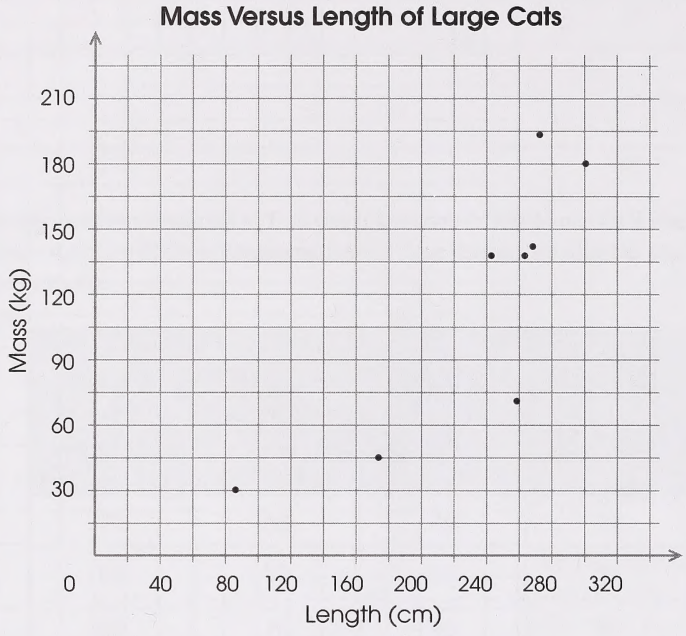
_____

(1) **d.** Is a high grade in Math 9 a good indicator of success in Math 10?

_____

_____

3. The following scatter plot shows the masses and lengths (including the tail) of various large cats. Is there an apparent relationship between this data? Explain.



(2) **a.** Describe the apparent relationship between the variables in this data.

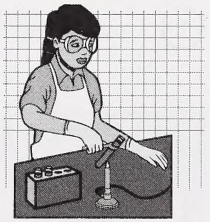
(2) **b.** How might the data have been collected differently to show a better relationship between the variables? Why?

4. Name the dependent and independent variables and state what type of relationship you would expect on a scatterplot for the following:

(2) **a.** distance to school and time it takes to get there

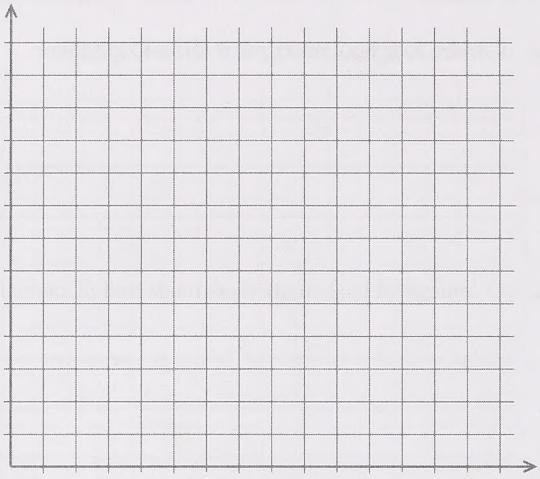
(2) **b.** percentage of basketball shots made and distance from the basket

5. A pharmaceutical company is testing a new painkiller to see if it has any side effects on the physical capabilities of the users. In one test, 15 university students were hired to take varying amounts of the painkiller, and were then asked to perform a number of simple physical tasks. The scores (out of 50) and the dosages were as follows:



Amount (mg)	Score	Amount (mg)	Score
2.8	40	2.3	15
4.5	18	4.3	24
4.0	21	3.7	30
5.4	15	6.1	10
1.5	37	3.0	32
6.2	6	4.9	22
3.5	31	3.4	35
6.3	12		

(2) **a.** Plot the data on a scatter plot; then draw the line of best fit by inspection.



(1) **b.** What effect on the physical capabilities is suggested as the result of an increase in the drug dosage?

_____

_____

(1) **c.** What performance would you expect on the physical tasks after a dosage of 3.3 mg?

_____

(1) **d.** According to the graph, up to what dosage would there be no effect of the drug?

_____

(1) **e.** If the university students were given a dosage of 7 mg, what score might you expect?

_____

(15)

Section 2 Assignment: Use and Misuse of Data

Read all the parts of your assignment carefully and record your answers in the appropriate place.

(3)

1. Explain how the following question is biased; then rewrite it to eliminate the bias.

> Should physical education be compulsory since a healthy body promotes a healthy mind?

Read the article "Reform running hot in Alberta but facing a tight race in city" and answer questions 2 to 5.

Reform running hot in Alberta but facing a tight race in city

JACK DANYLCHUK
Journal Staff Writer

Edmonton

Reform has a firm grip on the lead in Alberta, though it's in a dead heat with the Liberals for Edmonton.

A new poll shows Reform has the support of 41 per cent of Albertans.

Support for the Liberals is at 31 per cent among the 703 Albertans surveyed. Conservatives are at 21 per cent and the NDP at six per cent. The poll is accurate within 3.5 percentage points.

"The bad news for Reform in Alberta is that they are still 11 points lower than they got in October 1993," Richardson said.

"That means probably some of their urban seats are vulnerable."

In Edmonton, Reform and the Liberals were neck and neck at 38 and 37 per cent, respectively, with Conservatives trailing them at 14 per cent and the NDP at six.

The Angus Reid poll, conducted for Southam News and CTV News, would likely translate "into continued success for the Liberals, at least in Edmonton, but probably not in rural Alberta and perhaps not in Calgary," Richardson said.

Manning's clear shot at becoming opposition leader—given a 13 per cent drop in backing for the

Main campaign issues in the minds of voters

	Canada	Alberta
Jobs	55	37
Health care	29	35
Deficit/Debt	23	32
Taxes	17	21
Unity/Quebec	18	17
Economy	15	11
Education	14	17

The Question: *"What for you, personally, will be the most important issue in the federal election campaign?"*

Responses are measured in per cent and will add up to more than 100% as up to three isses were accepted.

Bloc Quebecois—could bolster support for Reform in Alberta ridings where the Liberals thought they stood a good chance to make gains.

In another poll taken earlier this year, "a significant minority want to see an official opposition other than the Bloc so that has to be somewhat good news for Reform," he said.

On issues, there is more concern with the debt and deficit in Alberta than anywhere in Canada—a point Richardson said scores well for both Liberals and Reform.

"Liberals get decent marks for general management of the economy and people think Reform would be very focused on the deficit," Richardson said.

"National unity is not a burning issue; people seem to be focused more on the economic issues, debt and deficit, and job creation."

Jobs, the top issue in the minds of 55 per cent of Canadians, got top ranking from only 37 per cent of Albertans.

Health care came second with 29 per cent across Canada and 35 per cent in Alberta. The debt and deficit was ranked third by 23 per cent of Canadians and 32 per cent of Albertans.

Liberals were the least popular with Alberta voters, who were more likely to look favourably on Reform party positions than any other group of Canadians polled.

Only 37 per cent thought the Liberals deserved re-election; 62 per cent thought another party could do better.

Fifty-six per cent of Albertans polled think Reform's ideas reflect mainstream views, compared with 48 per cent in B.C., 43 per cent in Saskatchewan and Manitoba and 40 per cent in Ontario, 35 per cent in the Atlantic region and 21 per cent in Quebec.

Reform and Manning were closest to the values of 42 per cent of Albertans polled, followed by Chretien and the Liberals, 21 per cent, Charest and the Conservatives, 19 per cent and McDonough and the NDP at 10 per cent.

Manning's party also won top marks with Albertans on all key questions except one—which party and leader would be best able to keep the country together. Liberals were the choice of 41 per cent compared to 18 per cent for Reform.

But when it came to being on the right track for the next century, Reform and Manning were favoured by 37 per cent, the Liberals 28 per cent, Conservatives 19 per cent and NDP six per cent.

On the question of honesty and trust, Manning won hands down at 41 per cent, with 18 per cent for the Liberals, 14 per cent for Charest and 8 per cent for McDonough.[1]

(1) **2.** How was the data regarding the position of each political party gathered?

_____

_____

(2) **3.** Was the conclusion appropriate for the sample used? Explain.

_____

_____

_____

(1) **4.** Is the information presented clearly and without bias?

_____

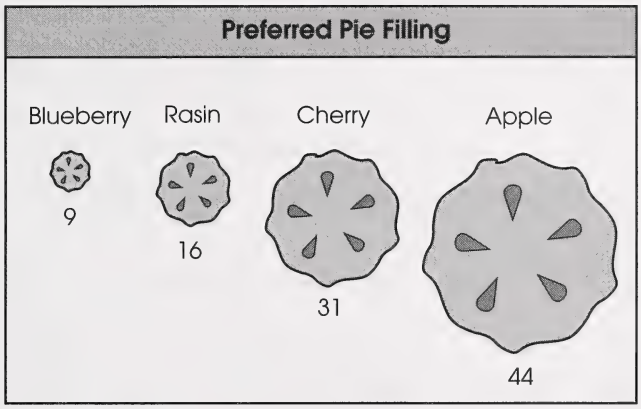
[1] Jack Danylchuk, "Reform Running Hot in Alberta but Facing a Tight Race in City," *The Edmonton Journal*, 10 May 1997, A4. Reprinted by permission.

(1) **5.** Is the question regarding the main campaign issues in the minds of voters asked clearly and without bias?

_____

_____

Use the following graph to answer questions 6 and 7.



(2) **6.** How is the information in the graph misleading? (**Hint:** Calculate the areas of the pie pictures.)

_____

_____

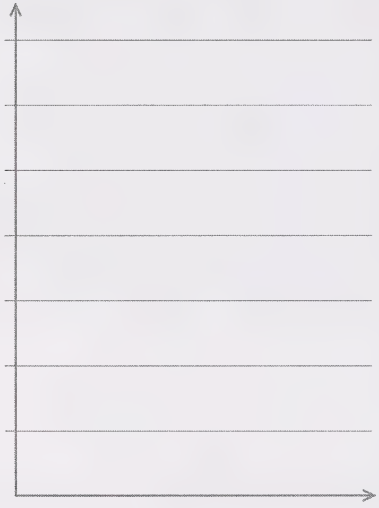
_____

(2) **7.** Draw the graph so that the same information is presented without bias.

8. Big Mogul is a company that sells ski equipment. Their annual sales for several years are as follows:

Year	Sales ($)
1992	297 144
1993	305 935
1994	314 649
1995	325 788
1996	381 460

(1) **a.** Draw a bar graph that displays the data without bias.

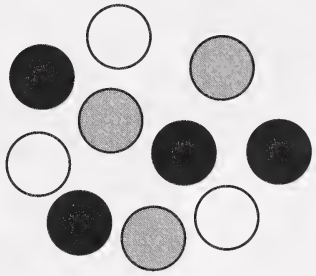


(2) **b.** Draw a bar graph that exaggerates the increase in sales.

(20) ## Section 3 Assignment: Probability and Decision Making

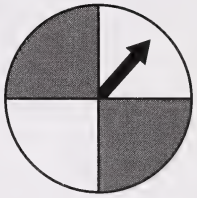
Read all the parts of your assignment carefully and record your answers in the appropriate place.

(3) **1.** Calculate the probability of rolling two dice and getting a sum of 3 and picking a black disk from the disks pictured after they are placed in a bag.



2. A die is rolled and the spinner pictured is spun.

(1) **a.** Calculate the probability of getting an even number and grey on the spinner.



(1) **b.** What is the probability of getting a number greater than 1 and landing on white?

3. A penny comes up heads on six tosses.

(1) **a.** Calculate the probability of this happening.

(2) **b.** What is the probability of it coming up heads on the seventh toss? Why?

_____

_____

_____

4. A long-range weather forecast gives the following probabilities of precipitation for the next five days.

Day	Probability of Precipitation
Monday	70%
Tuesday	90%
Wednesday	40%
Thursday	20%
Friday	30%

Calculate the probability of each of the following events.

(2) **a.** It rains on Monday and Wednesday.

(2) **b.** It rains on all five days.

(2) **c.** Bernice sees the previous five-day forecast for the area where she is making plans to go golfing this weekend. Do you think she should go ahead with her plans? Upon what criteria will she base her decision?

_____

_____

_____

(1) **5.** Why is buying a Lotto 6/49 ticket so appealing, even though the probability of winning the big prize is so low?

_____

_____

6. The probability of independent events is often applied to games. Suppose you are playing a game with two dice where Player 1 scores if the sum is a prime number and Player 2 scores if the sum is a composite number.

(2) **a.** Calculate the probability of winning for Player 1 and for Player 2.

(1) **b.** Is the game fair? Explain.

_____

_____

(2) **c.** How can you make the game fair? Calculate the odds for each player when the game is fair.

_____

_____

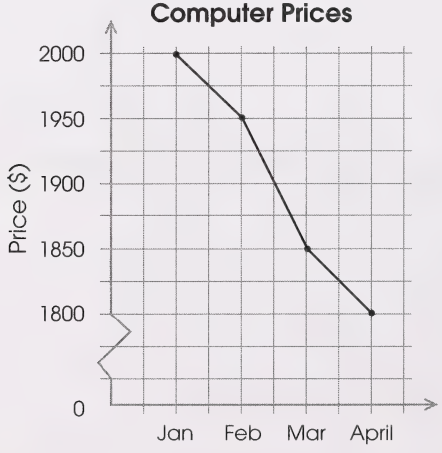
_____

(40)

Final Module Assignment

Read all the parts of your assignment carefully and record your answers in the appropriate place.

1. A computer sales company reported that the price of their most popular lap top model had dropped dramatically over the last few months. They produced the following graph to illustrate the point.



(1) **a.** Is their claim valid? Explain.

_____

_____

(1) **b.** How is their claim distorted?

_____

_____

2. "Statistics have shown that more people are listening to CKMD radio than ever before!"

(1) **a.** What is the news release hoping to accomplish?

_____

_____

(1) **b.** What can you really conclude from the news release?

_____

_____

(1) **c.** What information do you need to get a better picture of the stations' performance?

_____

_____

3. What apparent relationship exists between each of the following pairs of variables?

(1) **a.** weight and height

_____

_____

(1) **b.** flexibility and age

_____

_____

(1)

c. hours of sleep and calorie intake

_____

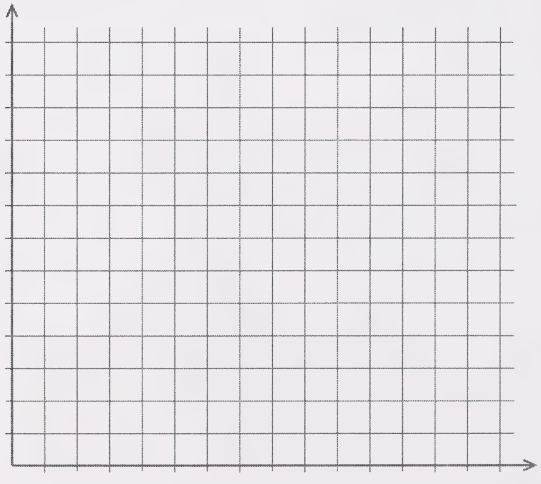
_____

4. Shara and Lenny conducted an experiment to determine if there was a relationship between circumference and diameter. They measured the circumference and diameter of various cylindrical objects and made the following chart.

Object	Diameter (cm)	Circumference (cm)
Pop Can	6.3	20.1
Soup Can	6.8	21.2
Tomato juice can	10.8	32.5
Glue Stick	3.0	10.0
Coffee can	13.1	40.8
Candle	4.5	18

(4)

a. Draw a scatter plot on the following grid. Label the axes and give the scatter plot a title. Draw in the line of best fit by inspection.



(1) **b.** From the scatter plot, what circumference would you expect for a diameter of 10 cm?

_____

(1) **c.** Use the circumference and diameter from question 4.b. to find the value of π. Is the value of π reasonable?

(1) **d.** Why might the one value be further off the line than the others?

_____

_____

5. A sporting goods store makes a claim that their super deluxe exercise machine is 30% better.

(1) **a.** What might this statement mean? Give at least two suggestions.

_____

_____

_____

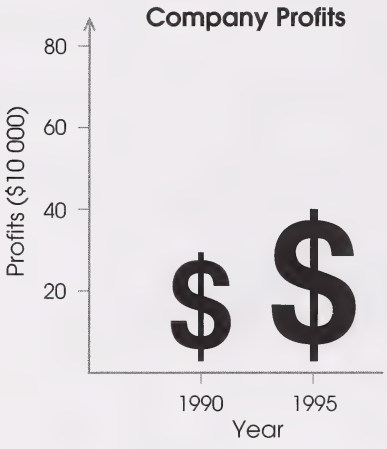
(1) **b.** What is wrong with this statement?

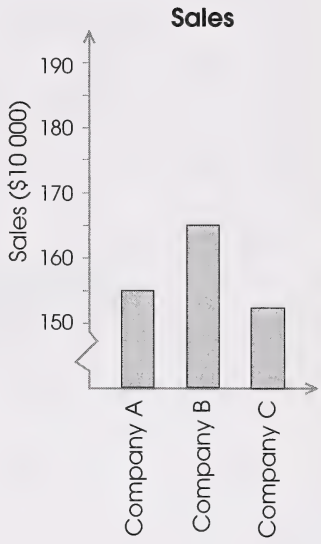
_____

_____

_____

6. Study each of the following graphs and answer the questions that follow.





(2) **a.** Outline how each graph is misleading.

(2) **b.** Describe the false impression each graph could give to the reader.

(2) **c.** Explain how you could modify these graphs to eliminate the false impression.

_____

_____

_____

_____

_____

_____

7. Two evenly matched hockey teams in the NHL playoffs square off in a best-of-7 series. The winner is the first team to win four games.

(1) **a.** What is the probability that one team wins four games straight?

(1) **b.** What is the probability that one team loses the first two games and then comes back to take the series by winning four straight games?

(1) **c.** What assumptions are made to calculate these probabilities?

_____

_____

8. Use the following survey questions to answer questions 8.a. and 8.b.

I. In our democratic country, anyone should be allowed to own an unregistered gun. Agree or disagree?

II. In order to cut down on the number of murders and assaults, everyone who owns a gun must have it registered. Agree or disagree?

III. All guns should be registered. Agree or disagree?

(1) **a.** Which survey question shows the least bias?

_____

(2) **b.** Who are the other two survey questions biased towards?

_____

_____

_____

(2) **9.** What is the probability of guessing and getting all ten true and false questions correct on a test? Show how you get your answer.

10. Find a newspaper or magazine article containing some type of data or graph of data. Assess how the data was collected and how it was presented by answering the following questions with reference to your article. Be sure to send the article with your assignment.

(1) **a.** How were the samples selected?

_____

_____

(1) **b.** Was there any bias in how the samples were selected?

_____

_____

(1) **c.** Was the data collection method appropriate for the data and the issue discussed?

_____

_____

(1) **d.** Is the data presented clearly and honestly?

_____

_____

(1) **e.** Do the conclusions follow logically from the data?

(1) **f.** Were any questions left unanswered? Why?

11. A weather report indicates that there is a 70% chance of rain on Friday, a 60% chance of rain on Saturday, and a 20% chance of rain on Sunday.

(1) **a.** Calculate the probability of rain falling on all three days.

(1) **b.** Does your answer to question 11.a. mean that you likely will not have any rain on the weekend? Explain.

(1) **c.** Would you go camping if you heard this forecast for the area where you want to go? Explain.

ASSIGNMENT BOOKLET DECLARATIONS

The Student's Declaration is to be filled in by a student registered at the Alberta Distance Learning Centre. If the student is under 16, the Learning Facilitator's Declaration is to be filled in by the learning facilitator. Failure to complete this page may invalidate the assignment results.

STUDENT'S DECLARATION

- I have followed the instructions outlined in the Student Module Booklet.
- I have completed the activities to prepare myself for the assignments in this Assignment Booklet.
- I completed the assignments in this Assignment Booklet by myself.

_____

Student's Signature

LEARNING FACILITATOR'S DECLARATION

I hereby certify that I have supervised the learning activities completed by _____.

Student's Name

I also certify that to the best of my knowledge the assignments in this Assignment Booklet were completed independently by this student.

_____

Supervisor's Signature

If you, the student or learning facilitator, have any comments or observations regarding this module, write them in the following space.

_____

_____

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Mathematics 9
Assignment Booklet
Module 6

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